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[3]Wildlife Conservation Society. Here, seven complete clutches of Morelet's crocodile (*Crocodylus moreletii*) eggs were obtained in northern Belize and examined for OC pesticide residues. Eggs were extracted using a Dionex 200 Accelerated Solvent Extractor and analyzed by GC/ECD. The primary OC detected, *p,p*-DDE, was found in every egg analyzed (n = 175). Other OCs detected included *p,p*-DDT, *p,p*-DDD, methoxychlor, and aldrin. Concentrations of individual OCs (wet weight) ranged from 4 ppb (ng chemical/g egg) to >0.5 ppm (µg chemical/g egg). Total concentration of OCs (sum of all OCs) for one egg collected from a nest at Gold Button Lagoon (GB) reached as high as 0.7 ppm. A statistical evaluation of DDE levels in three complete clutches was used to derive the minimum number of eggs needed from a clutch to accurately determine the mean DDE concentration representative of that clutch. Sample sizes of 8 eggs (80% confidence interval) and 11 eggs (90% confidence level) were determined to yield an accurate estimate of contaminant levels in a full clutch of eggs based on an average standard deviation (0.26 ng/g), average clutch size (n = 20), and acceptable deviation from the mean (± 0.1). The statistically recommended sample size of 11 eggs at t(90%) was successfully tested on four additional clutches.

P652 Expert System for Real-Time Biomonitoring of Environmental Toxicity. Wroblewski, D.[1], Viloria, J.[1], Shedd, T.R.[2], van der Schalie, W.H.[2] and Widder, M.W.[2] [1]Intelligent Automation Corporation. [2]U.S. Army Center for Environmental Health Research. Automated biomonitoring systems continuously monitor water quality and provide rapid notification of developing toxicity caused by a wide range of substances. An important goal for biomonitors is to maximize sensitivity to toxicants while minimizing false alarms that may be caused by non-harmful variations in water quality. Significant improvements in toxicity detection without an increase in false alarms are possible through the use of novel data processing and neural network modeling approaches developed for an automated fish biomonitoring system. Toxicity detection is based on simultaneous analysis of ventilatory and movement behavior of a group of eight fish (bluegill, *Lepomis macrochirus*) and water quality parameters (pH, dissolved oxygen, temperature, and conductivity). A general neural network model of fish behavior is used that does not need to be re-calibrated for each individual fish. The model can detect abnormal patterns in fish behavior associated with toxicity with a better signal-to-noise ratio than the present statistical approach, while distinguishing between changes in fish behavior due to toxicity or water quality variations. The automatic data interpretation is a part of Biomonitor Expert, a Windows-based program that addresses all aspects of the biomonitoring process, including data collection and storage, construction of neural network models of toxicity, user-friendly interfaces and remote notification tools. A modular design enables easy re-configuration of the system, inclusion of different data collection and processing schemes, and application to different biomonitoring applications and toxicity sensors.

P653 Accumulation of organochlorine compounds in fish collected from the coasts and purchased from the local markets in Korea. Hong, S.H., Yim, U.H., Shim, W.J. and Oh, J.R. Korea Ocean Research and Development Institute. Organochlorines in fish muscle collected from coastal water and purchased from the local markets of Korea were quantitatively determined. In addition, fish consumption risk assessment was carried out for human. Polychlorinated biphenyls (PCBs) and DDTs were the predominant contaminants whose concentrations ranged from 2.96 - 96.6 ng/g and 0.84 - 27.0 ng/g (wet weigh basis), respectively. The highest PCB concentration was found near the industrial complex. Hexachlorocyclohexane, chlordane-related compounds, and hexachlorobenzene concentrations were relatively low ranging 0.64 - 5.6 ng/g, 0.17 - 4.24 ng/g, and 0.08 - 1.58 ng/g, respectively. The collected fish showed approximately two times higher concentrations of PCBs and DDTs than the purchased ones, which means that recreational fisher have high latent possibility of exposure to organochlorine compounds. Risk-based screening value (SV) was calculated by using the EPA approach to identify the primary chemical of concern. Total PCB concentrations in all collected and purchased samples exceeded the SV value (6.49 ng/g), but the other compounds were mostly below the each SV value. Based on the estimated screening values, PCB compounds were identified as potential chemicals of concern throughout the coast of Korea.

P654 Biomonitoring in Tap Water Distribution Systems. Moldaenke, C.F. bbe Moldaenke. The advanced bbe Fish and Daphnia Toximeter observes young living fish (e.g. Zebrafish) and Daphnia under the influence of a "sample" water stream. bbe has developed a sensitive instrument for the detection of toxic compounds in water bodies such as rivers, water treatment plant intakes and sewers. Continuous biological monitoring with the combined bbe Fish and Daphnia Toximeter enables rapid detection of toxic substances in water and provides an on-line real time warning system. This unique instrument allows managers to rapidly detect, record and respond to incidents of toxic contamination. The combined Fish and Daphnia Toximeter is well suited to the detection of wilful or negligent damage to water systems. The use of the bbe Fish and Daphnia Toximeter in water distribution systems will be demonstrated. Dechlorination and reaction time will be discussed, sensitivity to a warfare chemical will be proven.

P655 The use of stable isotopes to trace oil sands constituents in reclaimed aquatic environments. Farwell, A.J. and Dixon, G. Department of Biology, University of Waterloo. The Athabasca oil sands deposit is the largest of four deposits in northern Alberta, Canada. Mining operations in the region continue to grow as demand for oil increases and new mining technologies are developed. There is a need to better understand the potential effects of oil sands constituents on aquatic ecosystems however defining exposure may be difficult. Preliminary studies showed the potential use of stable carbon isotopes of fish as a tracer of exposure to oil sands constituents (bitumen, $\delta^{13}C$ = -30.3‰ ± 0.1) in tributaries of the Athabasca River. The objective of this study is to examine the cycling of oil sands constituents in aquatic systems that differ in the level of exposure. Benthic invertebrates were collected from test pits at Syncrude Canada Ltd. which are similar in dimension (0.16 ha) and constructed in the same year (1989) but differ in the quantity of process-affected water and/or mature fine tailings (MFT) containing residual bitumen. Benthic invertebrates, particularly dragonflies and damselflies, showed trends of ^{13}C depletion and ^{15}N enrichment in pits with increased levels of process-affected water and/or MFT. The depletion of ^{13}C may indicate the assimilation and incorporation of oil sands constituents into the benthic foodweb. Test pits with high turbidity, showed the greatest ^{13}C depletion (~ -27 ‰), suggesting that microbial degradation of oil sands constituents vs. photosynthetic production may be important in this system. All benthic invertebrate groups (chironomids, amphipods, dragonflies and damselflies) showed an incremental enrichment of ^{15}N from the control pit to the pit with the highest levels of MFT. Enrichment of ^{15}N may be a function of differences in the abundance and composition of prey items within the different pits.

P656 Limitations of Urban PAH Source Determination using Priority Pollutant PAH data. Echols, K.R., Orazio, C.E. and Gale, R.W. USGS, Columbia Environmental Research Center. Heavy polyaromatic hydrocarbon (PAH) pollution exists in the sediments of the Grand Calumet River, Indiana Harbor and Indiana Harbor Canal. The sediments in this system have been exposed to numerous urban and industrial sources of PAHs for the better part of a century. A database of priority pollutant PAH sediment concentration data from various reports from the mid 1980s through 1999 (compiled by McDonald Associates) was used in the evaluations. PAHs from the system were evaluated in two ways: (1) multivariate statistical analysis using principal components analysis; and (2) determining pertinent PAH ratios. The principal components analysis showed that 97.6% of the sediment samples fell within the calculated model (95% confidence ellipse) and showed no separation of samples based on the type of PAH source, indicating that the patterns of sedimentary priority pollutant PAHs in this system